

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

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| Applicant's or agent's file reference PHDE040027WO | FOR FURTHER ACTION | | See item 4 below |
| International application No. PCT/IB2005/050200 | International filing date (day/month/year) 18 January 2005 (18.01.2005) | Priority date (day/month/year) 26 January 2004 (26.01.2004) | |
| International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237 | | | |
| Applicant PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH | | | |

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

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| Date of issuance of this report 27 July 2006 (27.07.2006) |
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 09 MAY 2005

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

| | | |
|--|--|--|
| To: see form PCT/SA/220 | | Date of mailing (day/month/year) see form PCT/SA/210 (second sheet) |
| Applicant's or agent's file reference see form PCT/SA/220 | | FOR FURTHER ACTION See paragraph 2 below |
| International application No. PCT/B2005/050200 | International filing date (day/month/year) 18.01.2005 | Priority date (day/month/year) 26.01.2004 |
| International Patent Classification (IPC) or both national classification and IPC H04N7/173 | | |
| Applicant PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH | | |

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for International preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/SA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/SA/220.

3. For further details, see notes to Form PCT/SA/220.

| | | |
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| Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx. 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Moschetti, F Telephone No. +49 89 2399-5264 |  |
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050200

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - a sequence listing
 - table(s) related to the sequence listing
 - b. format of material:
 - in written format
 - in computer readable form
 - c. time of filing/furnishing:
 - contained in the international application as filed.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority for the purposes of search.
3. In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or
industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | |
|-------------------------------|------|-------------------------|
| Novelty (N) | Yes: | Claims |
| | No: | Claims 1,3,5,7,11,12-14 |
| Inventive step (IS) | Yes: | Claims |
| | No: | Claims 2,4,6,8,9-10 |
| Industrial applicability (IA) | Yes: | Claims 1-14 |
| | No: | Claims |

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the International application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050200

Re Item V.

- 1 Reference is made to the following document:
D1 : US 2002/092031 A1 (DUDKIEWICZ GIL GAVRIEL ET AL) 11 July 2002 (2002-07-11)

2 INDEPENDENT CLAIM 1

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (the references in parentheses applying to this document):
a method for personalized broadcast service comprising:
- a content provider coupled in communication with user devices (see D1, page 1 prg.1, page 2 prg. 16, page 4 prg. 54).
- receiving at the broadcast service user profile information (see D1, page 9, prg. 88)
- receiving at the broadcast service program content from content provider (see D1, prg. 54-56)
- providing to devices an a priori recording schedule derived from profile information and programme content (see D1, prg. 88)
- receiving programme content at the broadcast service and the user devices and recording said programme content at the user device (see D1, prg. 88)
- analysing the programme content at the broadcast service (see D1, prg. 88)
- receiving the a posteriori selection schedule at the user (see D1, prg. 88, updating of the schedule) and processing the content recorded at the user device, pursuant to the selection schedule. The processing at the user device of the recorded content pursuant to the selection schedule is implicit.

3 INDEPENDENT CLAIMS 12-14

- 3.1 Independent claims 12-14 are independent claims belonging to different categories, whose subject-matter is mentioned in claim 1. They are not new for the same reasons as for claim 1

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4 DEPENDENT CLAIMS 2-11

Dependent claims 2-11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

4.1 Lack of novelty:

Claim 3:

User profile information is communicated to the broadcast service. This is implicitly disclosed in D1 (see D1, paragraphs 88-90, page 9).

Claim 5:

The broadcast service makes an analysis of the program content recorded and generates an a posteriori schedule (see D1 prg. 88).

Claim 7:

The broadcast service makes an analysis of the user profile and generates an a posteriori schedule (see D1 prg. 88).

Claim 11:

User profile information can be updated with feedback from users. This is implicitly disclosed in D1 (see D1, paragraphs 88-90, page 9).

4.2 Lack of inventive step:

The present application does not meet the requirements of Article 33(1) PCT, because the subject-matter of dependent claims 2,4,6,8,9-10 does not involve an inventive step in the sense of Article 33(3) PCT.

Claim 2:

The presence of EPG data in the programme content indicative data is obvious to the person skilled in the art.

Claim 4:

The broadcast service is operable to construct the recording schedule (see D1 prg. 106,

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page 11). The fact that EPG data can be used is obvious to the person skilled in the art.

Claim 6:

The analysis techniques of claim 6 are obvious to the person skilled in the art.

Claim 8:

It is obvious that metadata can include topic information summaries or genre classifications.

Claims 9-10:

It is obvious to the person skilled in the art of digital communications, that the program content and the side information can be transmitted on different communications means, according to their needed bandwidth.

- 5 Article 33(4) PCT: the subject-matter of claims 1-14 is considered to be industrially applicable.

Re Item VIII.

- 6 The application does not meet the requirements of Article 6 PCT, because the subject-matter of claims 9,12-14 is not clear

claim 9:

in particular, the subject-matter of claim 9 is not clear. Terms like "relatively high" and "relatively low" are not clear.

claims 12 -14:

the subject-matter of claims 12-14 omits essential technical features. They are extremely broad and speculative and in consequence do not find adequate technical support in the description. Moreover, the degree of limitation intended by the mere suitability of the system "for" distributing content, or to be rendered "operable" in "accordance with the

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INTERNATIONAL SEARCHING
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International application No.

PCT/IB2005/050200

method of claim 1" is left completely open. This places an undue burden on the reader in understanding the claim's intended scope (Art. 6 PCT).



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REC'D 27 JAN 2005

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Bescheinigung Certificate

Attestation

Die angehefteten Unterlagen stimmen mit der ursprünglich eingereichten Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.

The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr. Patent application No. Demande de brevet n°

04100269.2

Der Präsident des Europäischen Patentamts;
Im Auftrag
For the President of the European Patent Office
Le Président de l'Office européen des brevets
p.o.

R C van Dijk

**PRIORITY
DOCUMENT**

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)



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des brevets

Anmeldung Nr:
Application no.: 04100269.2
Demande no:

Anmeldetag:
Date of filing: 26.01.04
Date de dépôt:

Anmelder/Applicant(s)/Demandeur(s):

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PAYS-BAS

Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se referer à la description.)

Method of providing a personalized broadcast service

In Anspruch genommene Priorität(en) / Priority(ies) claimed /Priorité(s)
revendiquée(s)
Staat/Tag/Aktenzeichen/State/Date/File no./Pays/Date/Numéro de dépôt:

Internationale Patentklassifikation/International Patent Classification/
Classification internationale des brevets:

H04N7/173

Am Anmeldetag benannte Vertragstaaten/Contracting states designated at date of
filing/Etats contractants désignées lors du dépôt:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL
PT RO SE SI SK TR LI

DESCRIPTION

METHOD OF PROVIDING A PERSONALIZED BROADCAST SERVICE

Field of the invention

- 5 The present invention relates to methods of providing personalized broadcast services. Moreover, the invention also relates to systems operable according to the methods. Furthermore, the invention relates to devices of the systems operable to execute the methods.

10

Background to the invention

- Earlier in the evolution of television broadcasting services, broadcasting organisations were responsible for arranging programme material, for example news reports and films, into a sequence for transmission to remote users by way of electromagnetic wave transmission. The users had no influence on content transmitted to them apart from exercising their choice of which television channel to watch and returning programme ratings as feedback to the broadcasting organisations. Programme guides in printed form were available to assist the users select between available channels to watch programme material of personal preference to them. More recently, the availability of broadband fibre-optical communication services together with broader transmission bandwidths available from satellite communication systems has increased the choice of programme material that users can elect to receive and watch. In consequence, approaches to making selections of transmitted programme material have become an issue as the quantity of programme material available for reception has increased.

- As a further evolution of such approaches, the concept of personal radio/TV broadcast has been appreciated and devices and associated services for allowing individual users or groups of users to receive shows that have been individually composed for them have been evolved. For example, in an international PCT patent application no.

PCT/US00/23598 (WO 01/19084), there is described a system in which contributors such as individuals in their homes may create personal television channel programming.

In the system, personal television programs may be distributed to multiple viewers over a communication network such as the Internet. Moreover, in the system, personal

- 5 television program schedule information may be stored in a database that is also used to store programme schedule information for conventional television channels. Viewers are able to use a program guide or other interactive television application to view program schedule information, to set reminders, to set favourites, to establish parental control, and perform other such functions. Moreover, links may be provided from
- 10 displayed personal television channels to web sites, chat rooms, e-mail applications, and other such features.

The inventors have envisaged that the concept of personal radio/TV broadcast comprises devices/services which are capable of allowing single users or groups of

- 15 users to receive and view programme shows that have been individually composed for the users. However, although it is expected at some time in the future that there will be sufficient communication bandwidth available to transmit inexpensively full audio-visual content digitally on demand, there is perceived to be an intermediate stage in the nearer future during which there will be a demand for personalized services for which it
- 20 will not be possible or too costly to transmit directly from service providers to remote user devices on an individual basis; such a situation represents a problem towards which the present invention is addressed.

25 Summary of the invention

An object of the invention is to provide a method of presenting a personalized broadcast service to users based on contemporary high-bandwidth communication infrastructure supplemented by additional relatively low-bandwidth communication channels.

According to a first aspect of the present invention, there is provided a method of providing a personalized broadcast service, characterized in that the method includes steps of:

- (a) arranging for a content provider to be coupled in communication with one or more user devices and a broadcast service, the one or more user devices being operable to present personalized programme content to their respective one or more users;
 - 5 (b) receiving at the broadcast service user profile information from the one or more users;
 - 10 (c) receiving at the broadcast service programme content indicative data from the content provider;
 - (d) providing to the one or more devices an a priori recording schedule derived from at least one of the profile information and the programme content indicative data;
 - 15 (e) receiving programme content at the broadcast service and the one or more user devices and recording said received programme content at the one or more user devices;
 - (f) analyzing the received programme content at the broadcast service to generate an a posteriori selection schedule;
 - 20 (g) receiving the a posteriori selection schedule at the one or more user devices and processing the programme content recorded at the one or more user devices pursuant to the a posteriori selection schedule to generate the personalized programme content for presentation to the one or more users.
- 25 The invention is of advantage in that it is capable of providing a personalized broadcasting service based on contemporary communication infrastructure without needing to provide high-bandwidth communication paths from service providers individually to users.
- 30 Preferably, in the method, the programme content indicative data includes at least one of electronic programme guide (EPG) data and its associated meta data.

Preferably, in the method, the user profile information is communicated to the broadcast service by one or more of: via the one or more user devices, via a communication network such as the Internet, via a call centre, and by completion of one

- 5 or more questionnaires at premises where the one or more user devices are initially purchased.

Preferably, in the method, the broadcast service is operable to construct the a priori recording schedule by processing a list of available and receivable stations, and EPG

- 10 data including a corresponding list of temporally non-conflicting programmes.

Preferably, in the method, the broadcast service is operable to perform an analysis of programme content recorded thereat to generate the a posteriori selection schedule for communicating to the one or more user devices.

15

Preferably, in the method, the analysis utilizes at least one of: speech recognition, keyword spotting, topic detection, music genre classification, image analysis, video analysis.

- 20 Preferably, in the method, the broadcast service is operable to perform an analysis of user profile information to generate the a posteriori selection schedule for communicating to the one or more user devices. Use of user profile information is beneficial in creating a better tailored personal broadcasting service.

- 25 Preferably, in the method, the meta data includes parameters relating to at least one of: genre classification, topic information and summaries, subjective ratings.

Preferably, in the method, the programme content is arranged to be communicated from the content provider through relatively high bandwidth channels in step (e), and at least

- 30 one of the user profile information in step (a), the programme content indicative data in step (b), the recording schedule in step (d) and the selection schedule in step (f) are

arranged to be communicated through relatively low bandwidth channels. More preferably, in order to render the method capable of being implemented using contemporary communication links , the method is arranged such that:

- (a) said relatively high bandwidth channels include one or more of satellite broadcast, terrestrial radio wave broadcast, wide-bandwidth optical fibre broadcast, broadband Internet; and
 - (b) said relatively low bandwidth channels include one or more of radio wave communication, radio telephony, lower bandwidth optical fibre.
- 10 Preferably, in the method, the user profile information stored at the broadcast service is capable of being updated in response to feedback from the one or more users.

According to a second aspect of the invention, there is provided a communication system for distributing personalized programme content operable according to the 15 method of the first aspect of the invention.

According to a third aspect of the invention, there is provided a user device operable to function in the first aspect of the invention.

20 According to a fifth aspect of the invention, there is provided personalized programme data content generated according to the method of the first aspect of the invention.

It will be appreciated that features of the invention are susceptible to being combined in any combination without departing from the scope of the invention.

25

Description of the diagrams

Embodiments of the invention will now be described, by way of example only, with reference to the following diagrams, wherein:

30

Figure 1 is a diagram illustrating principal interactions between component parts of a system according to the invention; and

Figure 2 is a flow chart of steps executed in a method according to the invention.

5

Description of embodiments of the invention

In the following description, there is described a solution which the inventors have devised to at least partially address the aforesaid problem of providing more personalized radio/TV broadcast. The present invention makes use of common non-personalized content delivery channels and a low bandwidth control channel between service provider and user's remote devices. Common delivery channels are to be construed to include broadcasts via satellite, cable broadcast and electromagnetic (airwave) transmissions.

Thus, the inventors have devised a method of providing a personalized broadcast service which involves several processing steps that can be implemented either on a service-provider side or on a user-side, for example at a user device. The processing steps include:

- (S1) recording/storing programme content;
 - (S2) analysing/classifying programme content;
 - (S3) selecting programme content based on user profiles;
 - (S4) compiling/scheduling selected programme content into individual user shows;
- 25 and
- (S5) updating user profiles in response to feedback/interaction between the service-provider and the user.

In a first configuration, it is envisaged that it is potentially feasible to implement the aforesaid processing steps (S1) to (S5) at the user's remote device, thereby potentially rendering the service provider obsolete in this respect. However, such a first

configuration demands that the user's device is provided with a relative high storage capacity, with enough processing power for implementing real-time programme content classification, with a capability of implementing parallel multi-channel recording and also with support for a graphical interface for user profile generation.

5

- Alternatively, in a second configuration, it is envisaged that it is potentially feasible to implement the aforesaid processing steps (S1) to (S5) at the service provider, namely to perform pre-processing steps and transmit a fully compiled show for each individual user for replay at the user's device. Such a second configuration allows for relatively inexpensive user devices but involves high individual communication loads from the service provider to its users. The second configuration will overload contemporary service providers' and users' servers and devices, especially in the case of mobile wireless devices on account of either physical or economic constraints.
- 10 15 20
- In devising the present invention, the inventors have addressed communication bottlenecks which would arise in the aforesaid first and second configurations and therefore provide at least a partial solution in the case of contemporary and near-future communication infrastructure, namely to address device and service provider bandwidth limitations. The present invention utilizes distributed processing, especially when invoked in the context of audio/visual services.

- It is known contemporarily to manually mark start/end times of commercial blocks, for example a group of advertisements arranged in sequence, in TV programmes, for example movies; such manually marked times are made available by private users via the Internet or similar communication network to other users. The manually marked times can be used for the automatic removal of commercial advertisements in digital recordings of movies. However, such dissemination of information does not anticipate principal features of personalized broadcast such as:
- 25 30
- (a) automatic genre classification and/or key/word detection, especially when a server is not used for implementing classification labelling;

- (b) scheduling of programme content, especially when rearrangement of programme and/or programme fragments are involved;
 - (c) profiling using user-specific information; and
 - (d) a priori components, especially with regard to generation and transmission of individual recording schedules.
- 5

Thus, such marking of start/end times does not constitute a personalized broadcast service as perceived by the inventors.

- An existing service which is superficially related to the present invention is
- 10 contemporary TiVo; TiVo concerns a digital video recorder providing up to 60 hours recording capacity. A user of TiVo is contacted via a telephone line for a provider of the TiVo service to provide to the user programming information for executing the following:
 - (1) for adjusting recording times in the case of line-up changes, namely programme content temporal transmission schedule changes;
 - 15 (2) for recording every episode of a series, namely a "season pass";
 - (3) automatic recording of record shows selected according to one or more parameters, for example one or more of favourite actor, director, team and topic.
- In TiVo, the TiVo service provides user profiling aspects, in a manner akin to other
- 20 recommendation systems, as well as an a priori schedule to user devices.

The present invention is distinguished from TiVo, amongst other features, on account of steps of:

- (A) implementing a programme content analysis on service-provider side at
- 25 recording time;
- (B) generating a posteriori selection list; and
- (C) providing for individual show scheduling.

- In embodiments of the present invention, the inventors have appreciated that the
- 30 aforementioned individual steps S1 to S5 are susceptible to being implemented between user devices of modest computing power and memory capacity, namely "small footprint

devices", and a powerful server provided at an associated service provider. The steps S1 to S5 are capable of being implemented with a minimum amount of communication load between the users and the service provider in such a configuration. Moreover, the inventors have devised an interaction protocol not requiring any substantial direct

5 transmission of programme content data between the service provider and associated user devices.

- In order to described an embodiment of the invention in more detail, reference will now be made to Figure 1 which is a diagram illustrating principal interactions between
- 10 component parts of a system according to the invention. The system is indicated generally by 10 and comprises at least one remote user device and a service provider coupled in communication with the at least one user. There is provided a relatively high bandwidth communication path for programme content from the service provider to the at least one user; by "high bandwidth" is meant bandwidth sufficient for
- 15 conveying audio/visual programme content, whether in digital or analogue format. Moreover, there is also provided a relatively low bandwidth communication path for conveying user-generated control data from the at least one user to the service provider; by "low bandwidth" is meant bandwidth sufficient for conveying control data but insufficient for conveying significant amounts of programme content.
- 20 In Figure 1, the system 10 includes a user (UR) 20, a personal broadcast user device (PBUD) 30, a programme content provider (CP) 40 and a personal broadcast service (PBS) 50. Interactions between the user 20, the device 30, the provider 40 and the service 50 are denoted by arrows which denote exchanges of information and/or data.
- 25 Such exchanges are implemented according to a method of the invention which will now be described with reference to Figure 1. In the following description, symbols **S**, **D**, **C** are employed to denote "service provider", "user device" and "content provider" respectively.
- 30 In a first step (STP1) of the method, the user (UR) 20 transmits his/her profile to the service (PBS) 50, namely to a personal broadcast service provider **S**. Communication

of the profile can be executed by one or more of: the user (UR) 20 employing the device (PBUD) 30, via a communication network such as the Internet, telephonically via a call centre, and by filling in a questionnaire in a retailing store/shop selling the device (PBUD) 30. The first step is denoted by user profile (UP) 100 in Figure 1.

5

In a second step (STP2) of the method, the personal broadcast service (PBS) 50, namely S, obtains electronic programming guide (EPG) data from the programme content provider (CP) 40 or from external sources, for example Internet, about programmes that are to be broadcast in the near feature as well as meta data relating to entries in the

- 10 EPG. The meta data preferably includes parameters such as genre classification, topic information and summaries, subjective ratings amongst other parameters. The second step is denoted in Figure 1 by EPG data (EPG D) 110.

- 15 In a third step (STP3) of the method, the device (PBUD) 30, namely D, transmits a list of stations that it is able to receive to the personal service provider PBS 50. This list is preferably a sub-set of all stations potentially provided by the content provider (CP) 40, namely C. The third step is denoted by list of receivable stations (LRS) 120 in Figure 1.

- 20 In a fourth step (STP4) of the method, the personal broadcast service (PBS) 50, namely S, constructs, on the basis of the user profile from the first step:
- (a) the list of available and receivable stations; and
 - (b) the EPG data including a corresponding list of non-conflicting programmes comprising programme content that are most likely to comprise all material that
- 25 will be needed to assemble an individual show for the user (UR) 20.

- Such a corresponding list is termed "a priori recording schedule" which is transmitted to the device (PBUD) 30, namely to D. The fourth step is denoted by a priori recording schedule (API: RS) 130 in Figure 1. This term "non-conflicting" relates to the ability of the user device (PBUD) 30 to receive one or more channels and record them
- 30 simultaneously; for example, when the user device (PBUD) 30 is only capable of coping with one receiving channel, programme content sent to the user device (PBUD)

30 is arranged to be temporally non-overlapping. Preferably, the user profile (UP) 100 sent from the user (UR) 20 includes details of how many channels the user device (PBUD) 30 is capable of receiving and recording. When the user device (PBUD) 30 is capable of receiving and subsequently recording a plurality of channels simultaneously, 5 it is potentially feasible to provide the user (UR) 20 with a more personalized customized broadcast service by selecting amongst temporally-overlapping programmes. A degree to which the user device (PBUD) 30 is capable of receiving multiple channels will depend upon hardware employed by the user device (PBUD) 30 and available communication infrastructure coupled to the user device (PBUD) 30. By 10 including such channel details in the user profile (UP) 100 enables the system in Figure 1 to adapt to upgrades in user device (PBUD) 30 hardware to receive more channels.

In a fifth step (STP5), both the device (PBUD) 30, namely D, and the personal broadcast service (PBS) 50, namely S, record all programmes or programme parts 15 according to the a priori recording schedule established in the fourth step. This fifth step is denoted by content broadcast (CB) 140, 150 and also recording according to schedule (RAS) 160 in Figure 1.

In a sixth step (STP6) of the method, the personal broadcast service 50, namely S, 20 analyzes the recorded programmes from the fourth step. Such analysis may include many different processing steps, for example one or more of segmentation into fragments, speech recognition, keyword spotting, topic detection, music genre classification and so forth. The sixth step is denoted by content analysis (CA) 170 in Figure 1.

25 In a seventh step (STP7) of the method, the personal broadcast service 50, namely S, compiles the personal show for the user (UR) 20 by combining suited content fragments according to the user's (UR) 20 profile provided in the first step and the show specifications, for example a desired total time duration of the show. A list of time 30 stamps and programme identifiers, namely an a posteriori selection list, is sent to the device (PBUD) 30, namely to D, the list optionally including additional filler material.

The filler material preferably relates to introduction and transition (between programmes) moderation, uniform resource locator (URL) links and additional content and/or music. The seventh step is denoted by an a posteriori selection list/filler material (APO: SL, FM) 200 in Figure 1.

5

In an eighth step (STP8), the device (PBUD) 30, namely **D**, compiles the final personal show according to the a posteriori selection list of the seventh step by cutting and pasting its own recording of the required programmes; in other words, the device (PBUD) 30 cuts and pastes recordings stored in memory situated at the (PBUD) device

- 10 30. The eight step is denoted by personal show (PS) 220 in Figure 1. During or after playback of the show, the user (UR) 20 optionally provides feedback which is transmitted to the personal broadcast service (PBS) 50, namely to **S**, for updating the user profile as earlier provided in the first step; such optional feedback is denoted by user feedback (UF) 210 in Figure 1.

15

The eight steps, namely STP1 to STP8, are illustrated in a temporal sequence in Figure 2. It is to be noted that:

- (a) the content provider (CP) 40 provides the programme content;
- (b) the personal broadcast service (PBS) 50 structures a schedule for programme content customized for the user (UR) 20 in response to the user profile (UP) 100 and EPG data (EPG 110); and
- 20 (c) the device (PBUD) 30 is operable to receive, to subsequently process and finally arrange the programme content to generate the personal show for the user (UR) 20.
- 25 Thus, although the content provider 40 is susceptible to being implemented in a conventional manner, interaction between the broadcast service 50, the provider 40 and the device 30 as described in the foregoing renders the present invention distinguished from known personalized contemporary broadcast systems.
- 30 The present invention provides a benefit that it is capable of providing personal audio/visual broadcasts with a relatively small amount of effort and therefore lends

itself to use in at least the near future. Moreover, the present invention does not require relatively large provision of processing power at the user device (PBUD) 30.

Furthermore, a quantity of information exchanged between the content provider (CP) 40 and the broadcast service (PBS) 50 and the user device (PBUD) 30 is relatively small on account of substantial quantities of programme content being delivered from the content provider (CP) 40 to the broadcast service (PBS) 50 and the user device (PBUD) 30 via conventional established channels, for example airwaves and/or optical fibre cable. The present invention is thus susceptible to being implemented by suitably organising and arranging substantially conventional technology.

10

It will be appreciated that embodiments of the invention described in the foregoing are susceptible to being modified without departing from the scope of the invention as defined by the accompanying claims.

15 Expressions such as "comprise", "include", "incorporate", "contain", "is" and "have" are to be construed in a non-exclusive manner when interpreting the description and its associated claims, namely construed to allow for other items or components which are not explicitly defined also to be present. Reference to the singular is also to be construed in be a reference to the plural and vice versa.

20

CLAIMS

1. A method of providing a personalized broadcast service, characterized in that
the method includes steps of:
 - (a) arranging for a content provider (40) to be coupled in communication with one
or more user devices (30) and a broadcast service (50), the one or more user
devices (30) being operable to present personalized programme content to their
respective one or more users (20);
5
 - (b) receiving at the broadcast service (50) user profile information (100) from the
one or more users (20);
 - (c) receiving at the broadcast service (50) programme content indicative data (110)
10 from the content provider (40);
 - (d) providing to the one or more devices (30) an a priori recording schedule (130)
derived from at least one of the profile information (100) and the programme
content indicative data (110);
15
 - (e) receiving programme content (140, 150, 160) at the broadcast service and the
one or more user devices (30) and recording said received programme content at
the one or more user devices (30);
 - (f) analyzing the received programme content at the broadcast service (50) to
generate an a posteriori selection schedule (200);
15
 - (g) receiving the a posteriori selection schedule (200) at the one or more user
devices (30) and processing the programme content recorded at the one or more
user devices (30) pursuant to the a posteriori selection schedule (200) to
20 generate the personalized programme content for presentation to the one or more
users (20).

2. A method according to Claim 1, wherein the programme content indicative data (110) includes at least one of electronic programme guide (EPG) data and its associated meta data.
- 5 3. A method according to Claim 1, wherein the user profile information (100) is communicated to the broadcast service (50) by one or more of: via the one or more user devices (30), via a communication network such as the Internet, via a call centre, and by completion of one or more questionnaires at premises where the one or more user devices (30) are initially purchased.
10 4. A method according to Claim 1, wherein the broadcast service (50) is operable to construct the a priori recording schedule (130) by processing a list of available and receivable stations, and EPG data (110) including a corresponding list of temporally non-conflicting programmes.
15 5. A method according to Claim 1, wherein the broadcast service (50) is operable to perform an analysis of programme content recorded thereat to generate the a posteriori selection schedule (200) for communicating to the one or more user devices (30).
20 6. A method according to Claim 5, wherein the analysis utilizes at least one of: speech recognition, keyword spotting, topic detection, music genre classification, image analysis, video analysis.
25 7. A method according to Claim 1, wherein the broadcast service (50) is operable to perform an analysis of user profile information to generate the a posteriori selection schedule (200) for communicating to the one or more user devices (30).

8. A method according to Claim 2, wherein the meta data (110) includes parameters relating to at least one of: genre classification, topic information and summaries, subjective ratings.
- 5 9. A method according to Claim 1 wherein the programme content is arranged to be communicated from the content provider (40) through relatively high bandwidth channels in step (e), and at least one of the user profile information (100) in step (a), the programme content indicative data (110) in step (b), the recording schedule (130) in step (d) and the selection schedule (200) in step (f) are arranged to be communicated through relatively low bandwidth channels.
- 10 10. A method according to Claim 9, wherein:
 - (a) said relatively high bandwidth channels include one or more of satellite broadcast, terrestrial radio wave broadcast, wide-bandwidth optical fibre broadcast, broadband Internet; and
 - (b) said relatively low bandwidth channels include one or more of radio wave communication, radio telephony, lower bandwidth optical fibre.
- 15 11. A method according to Claim 1, wherein the user profile information (100) stored at the broadcast service (50) is capable of being updated in response to feedback from the one or more users (20).
- 20 12. A communication system for distributing personalized programme content operable according to the method of Claim 1.
- 25 13. A user device (30) operable to function according to the method of Claim 1.
14. Personalized programme data content (220) generated according to the method of Claim 1.

ABSTRACT

METHOD OF PROVIDING A PERSONALIZED BROADCAST SERVICE

There is described a method of providing a personalized broadcast service. The method involves arranging for a content provider (40) to communicate with a user device (30) and a broadcast service (50). The device (30) presents personalized programme content to its user (20). The method involves:

(a) receiving user profile information (100) from the user (20);

(b) receiving programme content indicative data (110) at the broadcast service (50);

(c) providing to the device (30) an a priori recording schedule (130) derived from
10 the profile information (100) and the indicative data (110);

(d) receiving programme content (140, 150) at the broadcast service (50) and the device (30) and recording said received programme content at the device (30);

(f) analyzing the received programme content at the broadcast service (50) to generate an a posteriori selection schedule (200);

15 (g) receiving the selection schedule (200) at the device and processing the programme content recorded at the device (30) pursuant to the selection schedule (200) to generate the personalized programme content for the user (20).

20 Figure 1

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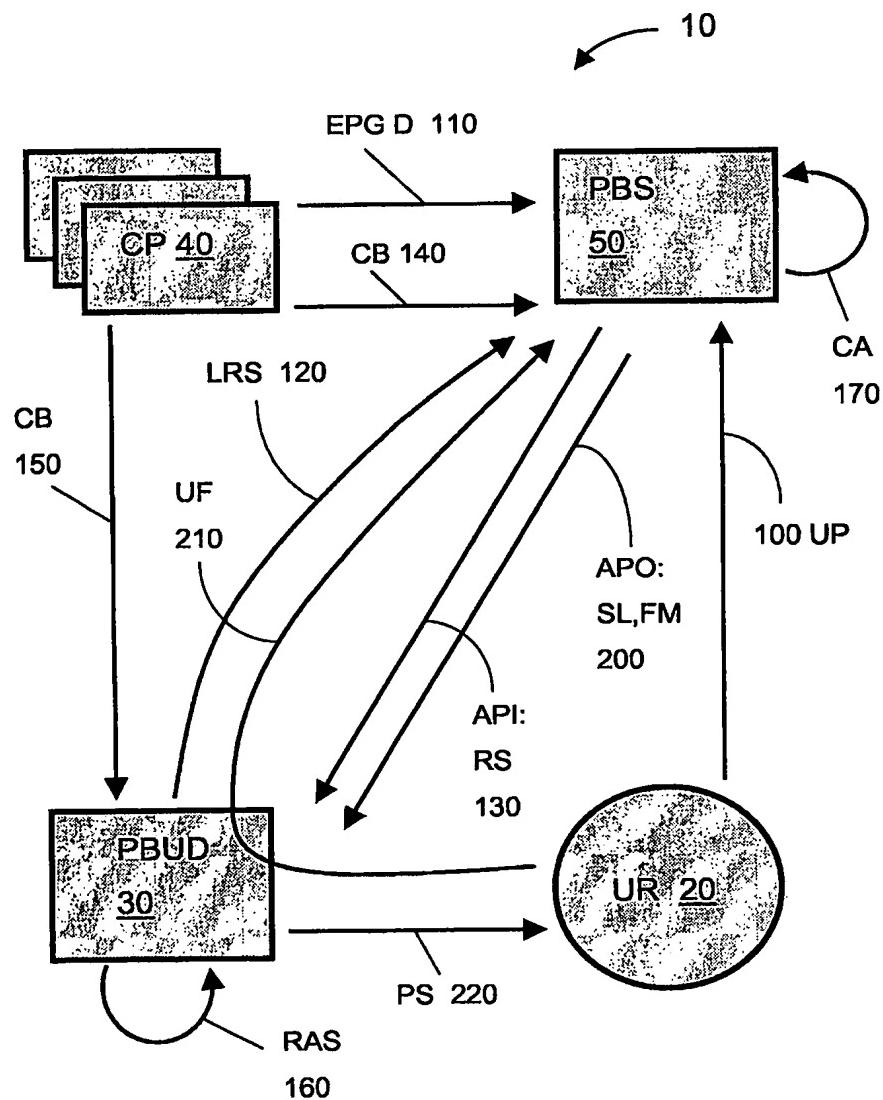


Fig. 1

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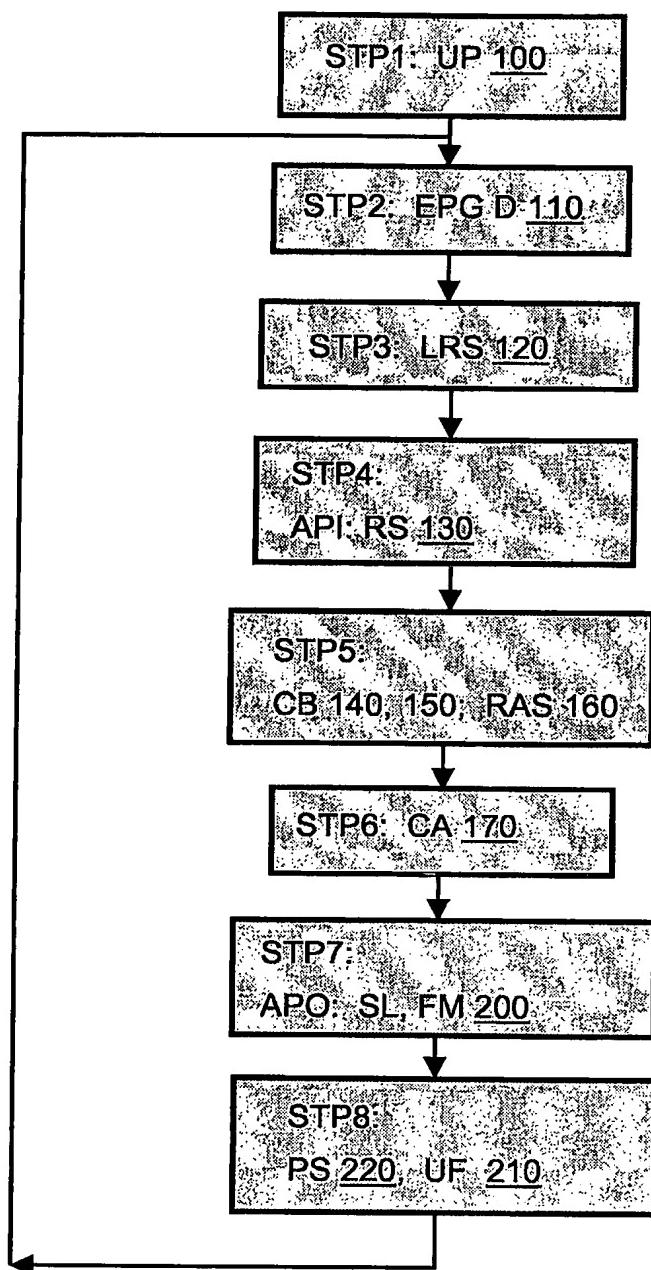


Fig. 2

PCT/IB2005/050200

